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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/718,769

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Matthew D. Felder

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EXAMINER

PRUCHNIC, STANLEY J

ART UNIT

PAPER NUMBER

2859

DATE MAILED: 01/11/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No.	Applicant(s)	
	10/718,769	FELDER, MATTHEW D.	
	Examiner	Art Unit	
	Stanley J. Pruchnic, Jr.	2859	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is FINAL.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-36 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-36 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)             | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. ____.  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date ____.   | 6) <input type="checkbox"/> Other: ____.                                    |

## DETAILED ACTION

### *Claim Objections*

1. Claims 1, 5, 8, 20 and 33 are objected to because of the following informalities:
  - a. In Claim 1, in Line 5, perhaps "**temperature-dependant**" after "**sensing a**" should be deleted and replaced therefor by -- **temperature-dependent** -- in order to correct the spelling.
  - b. In Claim 5, in Line 2, the limitation "the off-chip device" lacks antecedent basis.
  - c. In Claim 8, in Line 1, the limitation "the off-chip device" lacks antecedent basis.
  - d. In Claim 20, in Line 4, the limitation "the predetermined function" lacks antecedent basis; and it appears that the dependency of this claim should be changed -- i.e., in Line 1, after "Claim", replace "12" with --19-- in order to more clearly describe the invention.
  - e. In Claim 33, in Line 4, the limitation "the predetermined function" lacks antecedent basis; and it appears that the dependency of this claim should be changed -- i.e., in Line 1, after "Claim", replace "25" with --32-- in order to more clearly describe the invention.

Appropriate correction is required.

### *Claim Rejections - 35 USC § 102*

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1, 2, 4, 5, 7, 12-15, 18 and 19 are rejected under 35 U.S.C. 102(e) as being anticipated by US 6,674,185 B2 (**MIZUTA**).

**MIZUTA** discloses a digital thermometer for measuring a temperature of an off-chip device that comprises: an on-chip programmable current source (20; see Figs. 2 and 4A; Col. 3, Lines 53-62) to provide a current output (IF); an analog-to-digital converter 50 (Col. 5, Lines 49-52) operably coupled to sample a temperature-dependent voltage output VF produced by a temperature dependent resistive device (diode 31, in the embodiment of Fig. 2) and the current output IF and convert the temperature-dependent voltage output to a digital value (Col. 4, Lines 63-67); and a processing module that receives the digital value and equates the digital value to the temperature of the off-chip device as claimed by Applicant in **Claim 12**.

**MIZUTA** discloses the method for sensing a temperature of a device, as claimed by Applicant in **claim 1**, which is met in the normal operation of the digital thermometer as described above regarding **Claim 12**, as the disclosed thermometer is disclosed as establishing a programmable current IF for an on-chip current source 20; sensing a temperature-dependant voltage VF that is based on a temperature dependent resistive device 31 and the programmable current, wherein the temperature dependent resistive device is thermally coupled to the device; converting the temperature-dependant voltage to a digital value; and equating the digital value to the temperature of the device. **MIZUTA** does not explicitly disclose that the temperature dependent resistive device is thermally coupled to the device as claimed in **Claim 1**. The temperature dependent resistive device will be inherently be thermally coupled to whatever device it is used in for sensing the temperature of that device.

Further regarding **Claims 2, 7 and 13**: **MIZUTA** discloses the processing module (e.g., see Fig. 4C) directs the on-chip programmable current source to: increase the current output (Col. 6, Lines 49-57) if the digital value decreases below a lower threshold value; and decrease the current output (Col. 6, Lines 61-66) if the digital value increases above an upper threshold value. The method of claim 1 further comprises adjusting the programmable current such that the temperature-dependent voltage is within a predetermined range of values, the device being trimmed for temperature values in a desired temperature range, for converting the temperature-dependent voltage into the digital value, wherein the equating of the digital value is further based on the adjusting of the programmable current.

Further regarding **Claims 14 and 15**: **MIZUTA** discloses the analog-to-digital converter comprises a comparator (51); and the processing module auto-ranges the on-chip programmable current source so that the current output produces the temperature-dependent voltage output within a predetermined range.

Further regarding **Claims 4 and 18**: **MIZUTA** discloses the method and apparatus wherein the processing module equates the digital value to the temperature of the device further comprises determining the temperature of the device from a table (e.g., Fig. 5B) relating digital values to temperatures.

Further regarding **Claim 5 and 19**, **MIZUTA** discloses equating the digital value to the temperature of the off-chip device further comprises calculating the temperature of the off-chip device with a predetermined function wherein the temperature is a

function of: at least one property of the programmable current; a digitized voltage; and a set of physical properties of the temperature dependent resistive device.

***Claim Rejections - 35 USC § 103***

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 3, 6, 17, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over **MIZUTA** in view of US 4,161,880 A (**PROSKY**).

**MIZUTA**, to summarize, discloses all the limitations as claimed by Applicant in Claims 3, 6, 17, and 20 as described above in Paragraph 3 as applied to Claims 1, 2, 4, 5, 7, 12-15, 18 and 19, further including the temperature detecting circuit may be a diode or a transistor.

**MIZUTA** as described above, does not disclose that the temperature detecting circuit may include a thermistor as claimed by Applicant in Claims 3, 6, 17, and 20, and wherein the temperature is calculated from the function as claimed in Claims 6 and 20.

**PROSKY** discloses a digital thermometer employing a current source 16 for applying current to a thermistor 12, in order to create a voltage directly related to its temperature (Col. 3, Lines 20-45), and to calculate the temperature value using a well-known equation having a negative logarithmic relationship (Col. 4, Lines 1-30).

**PROSKY** is evidence that ordinary workers in the field of thermometry would recognize the benefit of substituting a thermistor as taught by **PROSKY** for the diode thermometer of **MIZUTA** in order to indicate a numerical value of temperature using a

logarithmic equation. Moreover, it is well known in the art to use a logarithmic equation for modeling the temperature dependence of a thermistor.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to substitute a thermistor for the diode in the thermometer of **MIZUTA** and to use a logarithmic equation since the device is nonlinear in order to calculate the numerical value of temperature as taught by **MIZUTA**.

6. Claims 8, 9, 22, and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over **MIZUTA** in view of US 5,459,671 A (**DULEY**).

**MIZUTA**, to summarize, discloses all the limitations as claimed by Applicant in Claims 8, 9, 22, and 23 as described above in Paragraph 3 as applied to Claims 1, 2, 4, 5, 7, 12-15, 18 and 19. **MIZUTA** as described above, does not disclose that the temperature detecting circuit is thermally coupled to an off-chip device being at least one of a hard drive and a battery and when the device is a battery, controlling a charge function of the battery based on the temperature of the battery.

**DULEY** discloses a battery controller that includes a temperature sensor, under control of a microcontroller. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to thermally couple the temperature sensor device of **MIZUTA** to an off-chip device in order to control a charge function of the battery based on the temperature of the battery as taught by **DULEY**.

7. Claims 8, 10 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over **MIZUTA** in view of US 6,092,926 A (**STILL et al.**, hereinafter **STILL**).

**MIZUTA**, to summarize, discloses all the limitations as claimed by Applicant in Claims 8, 10 and 21 as described above in Paragraph 3 as applied to Claims 1, 2, 4, 5,

7, 12-15, 18 and 19. **MIZUTA** as described above, does not disclose that the temperature detecting circuit is thermally coupled to an off-chip device being at least one of a hard drive and a battery and when the device is a harddrive, controlling the harddrive based on the temperature of the harddrive.

**STILL** discloses a device that includes a thermistor or thermocouple temperature sensor that is thermally coupled to the off-chip device. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to thermally couple the temperature sensor device of **MIZUTA** to an off-chip harddrive device in order to control the harddrive based on the temperature of the battery as taught by **STILL**.

8. Claims 11 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over **MIZUTA** in view of US 6,240,371 A (**AZAR**).

**MIZUTA**, to summarize, discloses all the limitations as claimed by Applicant in Claims 11 and 16 as described above in Paragraph 3 as applied to Claims 1, 2, 4, 5, 7, 12-15, 18 and 19. **MIZUTA** as described above, does not disclose a multiplexer that multiplexes the programmable current to a plurality of temperature dependent resistive devices thermally coupled to a plurality of devices; a demultiplexer that demultiplexes a plurality of temperature-dependant voltages to the analog-to-digital converter converting each temperature-dependant voltage to a digital value; and equating each digital value to the temperature of each of the plurality of off-chip and/or on-chip devices.

**AZAR** discloses (Figs. 3-4) a device for measuring a plurality of temperatures by using a multiplexer and a demultiplexer enabling a plurality of temperature-dependent voltages to be demultiplexed to the analog-to-digital converter converting each temperature-dependent voltage to a digital value, representative of temperature.



Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to add a multiplexer and demultiplexer to the thermometer of **MIZUTA** in order to enable measurement of the numerical value of a plurality of devices as taught by **AZAR**.

9. Claims 24-29 and 31-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over **MIZUTA** in view of **AZAR**.

**MIZUTA**, to summarize, discloses all the limitations as claimed by Applicant in Claims 24-28 and 31-32 as described above in Paragraph 3 as applied to Claims 1, 2, 4, 5, 7, 12-15, 18 and 19. **MIZUTA** as described above, does not disclose the additional limitation that the thermometer is located on an audio processing chip.

**AZAR** discloses a device for measuring a plurality of temperatures by using a multiplexer and a demultiplexer enabling a plurality of temperature-dependent voltages to the analog-to-digital converter converting each temperature-dependent voltage to a digital value, representative of temperature. Since the device is capable of measuring low frequency electrical signals, it is considered also to be an audio processing chip.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use the multiplexer and demultiplexer of the audio processor chip for the thermometer of **MIZUTA** in order to enable measurement of the numerical value of a plurality of temperature measurement devices as taught by **AZAR**.

10. Claims 30 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over **MIZUTA** and **AZAR** and further in view of **PROSKY**.

**MIZUTA** and **AZAR**, to summarize, discloses all the limitations as claimed by Applicant in Claims 30 and 33 as described above in Paragraph 9 as applied to Claims

24-29 and 31-32, further including the temperature detecting circuit may be a diode or a transistor.

**MIZUTA** as described above, does not disclose that the temperature detecting circuit may include a thermistor as claimed by Applicant in Claims 3, 6, 17, and 20, and wherein the temperature is calculated from the function as claimed in Claims 6 and 20.

PROSKY discloses a digital thermometer employing a current source 16 for applying current to a thermistor 12, in order to create a voltage directly related to its temperature (Col. 3, Lines 20-45), and to calculate the temperature value using a well-known equation having a negative logarithmic relationship (Col. 4, Lines 1-30).

PROSKY is evidence that ordinary workers in the field of thermometry would recognize the benefit of substituting a thermistor as taught by PROSKY for the diode thermometer of **MIZUTA** in order to indicate a numerical value of temperature using a logarithmic equation. Moreover, it is well known in the art to use a logarithmic equation for modeling the temperature dependence of a thermistor.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to substitute a thermistor for the diode in the thermometer of **MIZUTA** and to use a logarithmic equation since the device is nonlinear in order to calculate the numerical value of temperature as taught by **MIZUTA**.

11. Claims 35 and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over **MIZUTA** and **AZAR** and further in view of **DULEY**.

**MIZUTA** and **AZAR**, to summarize, discloses all the limitations as claimed by Applicant above in Paragraph 9 as applied to Claims 24-29 and 31-32. **MIZUTA** as described above, does not disclose that the temperature detecting circuit is thermally

coupled to an off-chip device being a battery and controlling a charge function of the battery based on the temperature of the battery.

**DULEY** discloses a battery controller that includes a temperature sensor, under control of a microcontroller. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to thermally couple the temperature sensor device of **MIZUTA** to an off-chip device in order to control a charge function of the battery based on the temperature of the battery as taught by **DULEY**.

12. **MIZUTA**, to summarize, discloses all the limitations as claimed by Applicant in Claim 34 as described above in Paragraph 3 as applied to Claims ,

13. Claim 34 is rejected under 35 U.S.C. 103(a) as being unpatentable over **MIZUTA** and **AZAR** and further in view of **STILL**.

**MIZUTA** and **AZAR**, to summarize, discloses all the limitations as claimed by Applicant above in Paragraph 9 as applied to Claims 24-29 and 31-32.

**MIZUTA** as described above, does not disclose that the temperature detecting circuit is thermally coupled to an off-chip device comprising a hard drive, and controlling the harddrive based on the temperature of the harddrive.

**STILL** discloses a device that includes a thermistor or thermocouple temperature sensor that is thermally coupled to the off-chip device. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to thermally couple the temperature sensor device of **MIZUTA** to an off-chip harddrive device in order to control the harddrive based on the temperature of the battery as taught by **STILL**.

Art Unit: 2859

### **Conclusion**

14. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The prior art cited in a form PTO-892 and not mentioned above disclose related temperature measurement devices and methods.

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stanley J. Pruchnic, Jr., whose telephone number is **(571) 272-2248**. The examiner can normally be reached on weekdays (Monday through Friday) from 7:30 AM to 4:00 PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Diego F. F. Gutierrez can be reached at **(571) 272-2245**.

The **Official FAX** number for Technology Center 2800 is **(703) 872-9306** for **all official communications**.

Any inquiry of a general nature or relating to the status of this application or proceeding may be directed to the official USPTO website at **<http://www.uspto.gov/>** or you may call the **USPTO Call Center** at **800-786-9199** or 703-308-4357. The Technology Center 2800 Customer Service FAX phone number is (703) 872-9317.

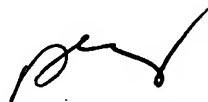
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Stanley J. Pruchnic, Jr.  
1/10/05



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